

RESEARCH ARTICLE

Increased mobile phone use in high school students as a social problem under the dimension of addiction

Stefanos Armakolas^{1*} Chrysavgi Lora¹ Anna Waligóra²
¹ Department of Education and Social Work, University of Patras, Patras, Greece

² Department of Sociology and Business Ethics, Poznań University of Economics and Business, Poznań, Poland


Correspondence to: Stefanos Armakolas, Department of Education and Social Work, University of Patras, Patras, Greece; Email: stefarmak@upatras.gr

Received: December 18, 2023;

Accepted: February 10, 2024;

Published: February 14, 2024.

Citation: Armakolas, N., Lora, C., & Waligóra, A. (2024). Increased mobile phone use in high school students as a social problem under the dimension of addiction. *Advances in Mobile Learning Educational Research*, 4(1), 911-919. <https://doi.org/10.25082/AMLER.2024.01.002>

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Abstract: Nowadays, mobile phone usage is increasing, especially among children and adolescents. Mobile phones can offer a multitude of advantages, such as instant communication, entertainment, and information. Of course, the frequency regarding mobile phone usage and exposure poses risks, such as mobile phone addiction. Adolescents now have their own mobile phone and use it most of the time without limitations, with the risk of becoming addicted. The purpose of this research is to examine the increased mobile phone use among high school students, which may lead to addiction, as a social problem related to the lack of social interactions. The research method of the survey is quantitative. The sample of the quantitative method consists of 110 adolescents attending high school, each one equipped with a personal mobile phone. Several conclusions were drawn about mobile phone addiction and its association with social factor and the networks of adolescents. Data showed that parental educational level and average family income positively influenced the likelihood of adolescent mobile phone addiction. In contrast, no association was observed in terms of gender with adolescents' mobile phone addiction. It was observed that parental networks and peer networks had a negative effect on adolescents' mobile phone addiction. The research findings point middle family income and parents with a higher education degree are factors associated with adolescent mobile phone addiction. Additionally organizational networks, peer networks and parental networks are associated with adolescents' mobile phone addiction. Our research presents some limitations but paves the way for future research for the findings to become enhanced.

Keywords: mobile phone addiction, adolescents, social factors, social networks

1 Introduction

The recent development and evolution of the multifunctional mobile phone and its continued global popularity has created a new landscape of communication and information. Mobile phone is characterized as a personal device that offers its users a multitude of advantages. Its main feature is the provision of permanent access to the Internet. Also, some of its advantages include the fact that it provides sociability, entertainment, searching informations, time management and maintaining social identity (Bian & Leung, 2015; Kuss *et al.*, 2018; Kwon *et al.*, 2013; Lin *et al.*, 2014).

Nevertheless, the constant, unrestricted access to the Internet via mobile phone and the increase in mobile phone users has raised concerns around the world about mobile phone overuse and risk of addiction. According to the literature, mobile phone has become an integral part of everyday life and it is shown that some people become overly attached to their device that they experience separation anxiety when they do not have it with them (Cheever *et al.*, 2014; King *et al.*, 2013; Alpochoritis, *et al.*, 2021).

In addition, most research that studies either problematic mobile phone use, or addiction focuses on a specific population group. According to literature the aforementioned group is adolescents, which is considered a high risk one (Davey, & Davey, 2014; Cha & Seo, 2018). This is because adolescents are in most cases highly attached to their smartphones. Many mobile phone users have reported that they could not live without it (Wajcman *et al.*, 2007). They also show a special interest in new technology and get used to operating new devices

more easily than adults. They can express themselves better, with freedom in an online space, use many apps, keep up with fashion, and develop emotional relationships through social networks (Cha & Seo, 2018). Thus, these characteristics combined with immature control ability make adolescents and pre-adolescents a high-risk group for mobile phone addiction.

To examine the factors leading to mobile phone addiction, we will make a reference to previous studies which have focused on social interactions and resources associated with smartphone addiction. According to Putnam's Social Capital Theory (2001) that, analyses the term social capital which includes trust, reciprocity and social networks formed by the individuals. From these springs collective action, which can contribute to improving the quality of life in the public sphere, to the more orderly functioning of representative institutions and to economic development. Through social capital, individuals can use their membership of groups and networks to secure their privileges. Social capital is a public good and is therefore often marginalized, without being produced by private actors, and in order to prevent it from disappearing, institutions play an important role. So, if individuals have rich social resources, they may receive psychological and social support from their networks and have more opportunities for offline interactions. They may reduce their stress and anxiety in offline social interactions and be less likely to become dependent on a mobile phone. To have a more comprehensive understanding of mobile phone addiction there is a need to go beyond psychological characteristics and consider the social interactions of individuals. Ihm's (2018) research on the social impact of mobile phone addiction in children studied the role of children's support networks (organization network, parent network, peer network). The above research showed that mobile phone addiction can be a social problem resulting from a lack of social connections. Additionally, seeking professional counseling and adopting an authoritative parenting style can be effective in addressing and preventing smartphone addiction in children. Ching & Tak, (2017) research points out that sufficient parent-child interaction and relationship has a positive effect on the prevention of compulsive mobile phone use.

Therefore, to fully understand and address mobile phone addiction in children, it is essential to consider the social interactions and support networks of individuals, in addition to psychological characteristics.

2 Literature review

2.1 Social network

Social life is primarily created by relationships and the patterns formed by these relationships (Scott, 2017). The concept of social network has been of interest to several researchers over the past decades. An individual's network creates bonds with other people, and these bonds can influence that subject's emotions, health, and sex life. Social connections are part of human nature and can offer as many promises as they do risks. The networks that humans create sometimes grow, change, reproduce, survive, or die (Christakis & Fowler, 2009). Furthermore, social networks can contribute to imitation behaviors. Imitation is either cognitive, i.e. something we deliberately think about, or physiological, i.e. a natural biological process.

2.2 Three types of adolescent's social networks

The first is the organizational network, the second is the parental network, and the last is the peer network. Previous research suggests that formal organizational membership can provide feelings of support and safety (Ihm & Hsieh, 2015; Lin et al., 2014), which are identified as important factors in reducing media addiction (Samaha & Hawi, 2016; Tsai et al, 2009). In addition, parents have an important role in preventing media addiction among children by providing feelings of safety and support (Ihm, 2018). When the parent-child relationship is at a good level of understanding and satisfaction, it can act as a deterrent to children's Internet addiction, thus reducing social anxiety level. Considering the function of the social network, adolescents can be influenced either positively or negatively by the peer network and imitate behaviors.

Furthermore, adolescents are more vulnerable and aware of the approval and disapproval of their friends than of their parents or teachers (Morrow, 1999). Thus, peer networks can strongly determine adolescents' behavior. When adolescents "bond" with their peers, they feel more secure and comfortable.

2.3 Socio-demographic factors

Furthermore, the contribution of socio-demographic factors to mobile phone addiction in adolescents has been discussed (Geser, 2006). Specifically, the gender factor is reported in the literature to influence the development of mobile phone addiction, with girls being more likely to be addicted than boys (Randler et al., 2016; Choliz, 2012; Lopez-Fernandez et al., 2015; Seo et al., 2016; Yang et al., 2010). Also, low parental education level appears to act as a negative factor in the onset of adolescent mobile phone addiction compared to high parental education level (Claesdotter-Knutsson et al., 2021; Roser et al., 2016; Shirley & Kumar, 2020).

In addition, another factor influencing on the onset of addiction is parental income. High-income parents easily provide their children with mobile phones and Internet access. Thus, studies have reported that children with high and middle family incomes are more prone to problematic mobile phone use (Nikken & Schols, 2015).

3 Methods

3.1 Research rationale aims and questions

Considering the social aspect of mobile phone addiction in adolescents, the purpose of this research is to examine the increased mobile phone use among high school students, which may lead to addiction, as a social problem related to the lack of social interactions. The present study will try to answer the following questions:

- (1) How do social factors relate to mobile phone addiction in adolescents?
- (2) To what extent are organizational networks, peer networks, and parental networks related to adolescent mobile phone addiction?
- (3) What are some strategies for reducing mobile phone use among high school students?

3.2 Research participants and educational setting

The sampling method followed in the survey was convenience sampling. The research method of the survey is quantitative. The sample of the quantitative method consists of 110 adolescents attending high school, each one equipped with a personal mobile phone.

Quantitative data were collected using a formatted on-line self-report questionnaire with predetermined questions. The constructed questionnaire consisted of 36 questions in total. Of these, the first 5 were demographic in nature. The remaining questions were divided into four (4) categories: **A.** The organization network; **B.** The peer network; **C.** The parental network; and **D.** The use of a mobile phone. Data in most of the questions were collected using a five-point Likert scale except for the question in group B, where the responses were of the YES/NO type. Specifically, to verify the 2nd research question, the scales of Ihm's research (2018) were applied. Formal organizational membership was measured with a question asking if participants belonged to any offline organizations, such as "school activities", "political organizations", "religious organizations", and "volunteer organizations". Responses were given as 'yes' and 'no'. For parental networks, the study used a modified measure of parental attachment. Participants reported their range of agreement with eight statements from 1 (strongly disagree) to 5 (strongly agree) and their responses were averaged. Participants also described their peer networks. The survey used measures to ask about participants' relationships with their peers in the past year from 1 (strongly disagree) to 5 (strongly agree). Two distinct factors of peer networks also emerge from the literature. The first factor represented the degree of closeness with peers, such as good relationships and mutual feelings with their networks. The second factor represented the degree of actual support from their peer networks. For the association of social networks with mobile phone addiction, scales and multiple-choice questions were used. That is, the 10 sentences are answered on a 5-point Likert scale ranging from 1 ("not at all true") to 5 ("very much true"). For mobile phone addiction, the MPPUS-10 was used. A 10-sentence scale covering the addictive symptoms of tolerance, escape from other problems, withdrawal, craving and negative consequences in life (Foerster et al., 2015).

3.3 Research procedure

This research was granted ethical approval by the first author's university. Pre-testing of the questionnaire and the interview questions was carried out prior to conducting the

survey. Initially, the questionnaire was sent to a small sample of students (10 students) who met the criteria for participation in the study to complete the questionnaire. In this way, errors and ambiguities in the questions were identified. Subsequently, appropriate changes were made, and eventually, it was sent corrected for completion by the sample. Prior to conducting the survey, students were informed of the anonymity policy and informed consent was obtained. Participants were also made aware that the data would be used as part of a university dissertation. The questionnaire was constructed using the Google Forms application. The digital questionnaire was emailed to individuals who were known in advance to meet the criteria to participate in the study. Data were collected in the winter of 2022.

Quantitative data collection and analysis (descriptive statistics) was performed, and test of normality was applied using Kolmogorov-Smirnov test (test of normality, $n > 50$, $p < 0.05$). The test showed a non-normal distribution and therefore non-parametric statistical criteria were used. Also, Spearman's rank correlation coefficient (Spearman's rank correlation coefficient, or r_s) test was applied to detect correlations between regular scale variables. Correlation testing by finding Spearman's r_s was conducted to test research question 1.

4 Results

The results showed that most of the participants in the sample were female at 79.1% ($n = 87$). Also, Participants' family income was observed to range from 20,001-30,000 in the majority with 32.7% ($n = 36$). In addition, the educational level of the participants' fathers that dominated the survey was University degree at 38.2% ($n = 42$) and high school graduates again 38.2% ($n = 42$). Finally, the educational level of the participants' mothers that dominated the survey was University degree at 51.8% ($n = 57$).

The descriptive results of the study variables are presented in Table 1, 2 and 3. As shown, in Table 1, at the question on adolescents' participation in school activities, the highest percentage of the answer was Yes ($n = 89$, 80.9%). Also, according to the Table 2, the adolescents who participated in the survey stated that they believe that their parents are proud of them ($n = 50$, 45.5%) and 44.5% stated that they strongly agree with the statement. "My parents enjoy spending time with me". Furthermore, according to the Table 3, 44.5% ($n = 49$) agreed with the statement that they always have a good relationship with their friends. Regarding the questions on mobile phone use 68 out of 110 respondents answered that the sentence "My friends complain that I spend a lot of time using my mobile phone when I am with them" is not true at all. Also, most adolescents, 57.3% ($n = 63$) reported that it is not true at all that they are late for appointments because they are busy with their mobile phone. Finally, 73 out of 110 survey participants responded that the statement "I go over the limit in terms of the money my parents pay for my mobile phone bill" is not true at all, ($n = 73$, 66.4%).

Table 1 The organization network of the participants

Organizing networks	n (%)	Answer
3.1 Do you participate in school activities?	89 (80.9%)	Yes
3.2 Do you participate in political organizations?	98 (89.1%)	No
3.3 Do you participate in religious organizations?	98 (89.1%)	No
3.4 Do you participate in voluntary organizations?	55 (50.0%)	Yes/No

Table 2 The parental networks of the participants

Parental networks	n (%)	Answer
4.1 I talk a lot with my parents	40 (36.4%)	Agree
4.2 I often express to my parents that I love them	29 (26.4%)	Agree
4.3 My parents often express that they love me	41 (37.5%)	Strongly agree
4.4 My parents often reward me	34 (30.9%)	Neither agree nor disagree
4.5 My parents are proud of me	50 (45.5%)	Strongly agree
4.6 I think I give positive energy to my parents	29 (26.4%)	Neither agree nor disagree
4.7 My parents give me courage when I am going through difficulties	31 (28.2%)	Strongly agree
4.8 My parents enjoy spending time with me	49 (44.5%)	Strongly agree
4.9 I would like to spend more time with my parents	34 (30.9%)	Neither agree nor disagree

Correlations between observable study variables are presented in Table 4. This table shows the association of the organization network, peer network and parental network with

Table 3 The peer network of the participants

Peer networks	n (%)	Answer
5.1 I always have a good relationship with my friends	49 (44.5%)	Agree
5.2 My friends always have good feelings towards me	45 (40.9%)	Agree
5.3 My friends help me when I am in trouble	43 (39.1%)	Agree
5.4 My friends stand by me when I am lonely or having a hard time	42 (38.2%)	Strongly agree

Table 4 Spearman's Correlations between observable study variables

Question	7.3	7.4	7.6	7.8	7.10	7.11	7.12
I talk a lot with my parents		-0.213*	-0.234*				
I often express to my parents that I love them		-0.284*	-0.250*	-0.276*			
My parents often express that they love me		-0.195*		-0.199*			
My parents often reward me		-0.219*					
My parents give me courage when I'm going through difficulties		-0.194*					
My parents enjoy spending time with me		-0.286*					
I would like to spend more time with my parents				-0.194*			
I always have a good relationship with my friends	-0.208*						
My friends help me when I am in trouble	-0.206*						
My friends stand by me when I am lonely or having a hard time	-0.282*						
Participation in voluntary organizations		-0.203*	-0.322**		-0.195*	-0.241*	

Note: * $p < 0.005$

adolescents' mobile phone addiction. To test this research question, the data collected from participants' responses to questions 3, 4 and 5 were correlated with their responses to question 8. As can be seen the correlations are negative. The following correlations are presented as an indication: The more adolescents reported being involved in volunteer organizations, the less likely they are to feel anxious if they have not checked messages or turned on their cell phone for a period of time $r_s (108) = -0.203$; $p < 0.005$. (Q. 3.4 and 7.4). The more adolescents reported talking a lot with their parents, the lower the likelihood of feeling anxious if they have not checked messages or turned on their mobile phone for some time $r_s (108) = -0.213$; $p < 0.005$. (Q. 4.1 and 7.4).

The correlation between social factors and addiction in adolescents is positive. To test this research question, the data collected from participants' responses to question 2 were correlated with their responses to question 8. The following correlations are presented as an indication: The more the adolescent's family that he or she overuses his or her cell phone the greater the likelihood that it is associated with the father's educational level $r_s (108) = 0.245$; $p < 0.005$. (Q. 7.7 and 2.2) The more the adolescent has been told that he or she spends too much time on his or her cell phone the greater the likelihood that it is associated with the father's educational level $r_s (108) = 0.190$; $p < 0.005$. (Q. 7.11 and 2.2). The more the adolescent's family tells the adolescent that he uses his cell phone too much the greater the likelihood there is of it being associated with the mother's educational level $r_s (108) = 0.280$; $p < 0.005$. (Q. 7.7 and 2.3).

5 Discussion

The data obtained from the questionnaire responses and interviews are partly in agreement with previous research, while some disagreed. Regarding adolescents' organizational network, it was observed that the more adolescents participate in voluntary organizations, the less likely they are to experience problematic mobile phone use, confirming the research of [Ihm \(2018\)](#), [Ihm & Hsieh \(2015\)](#) and [Lin et al. \(2013\)](#) in that formal organizational membership can provide feelings of support and safety, which are identified as important factors in reducing media addiction. However, the present study contradicts one of [Ihm's \(2018\)](#) findings on adolescents' participation in collective and religious organizations that showed that they have a significant impact on avoiding mobile phone addiction. The present study did not find any association with these organizations.

According to the present study, adolescents' peer network seems to have a positive effect on avoiding excessive mobile phone use which is in line with previous research by [Ihm \(2018\)](#) and [Tsai et al. \(2009\)](#) in that peer networks provide adolescents with safety, support, and comfort. Also, the current research agrees with the findings of studies such as [Lin et al. \(2013\)](#) and [Sarason & Sarason \(2013\)](#) that peer networks provide immediate help and support when an adolescent is in trouble or in need. Furthermore, according to the statements

of some of the parents in the interview, it was observed that their children's peer network works supportively as adolescents rely on the help and advice of their friends, which is in line with the findings of [Ihm \(2018\)](#) and [Sarason & Sarason \(2013\)](#).

The adolescents' responses showed that the more parents' networks with their children are developed, the less likely adolescents are to develop mobile phone addiction, confirming the research of [Ihm \(2018\)](#) and [Ching & Tak \(2017\)](#) in which it was found that parents can prevent their children's behavior such as mobile phone addiction and provide their children with feelings of safety and support in whatever they need. Interestingly, the views of parents recorded in the interviews regarding the parent network are interesting. It appeared that teachers are aware of the value of the mobile phone in their children's daily lives and that they cannot prevent their children from using it. They also stated that they support and stand by their children and reward them frequently.

Regarding the influence of gender on increased mobile phone use observed in the present study contradicts the findings of studies such as [Randler et al. \(2016\)](#), [Choliz \(2012\)](#), [Seo et al. \(2016\)](#), [Bianchi & Phillips \(2005\)](#), [Yang et al. \(2010\)](#), [Lopez-Fernandez et al. \(2015\)](#), and [Sánchez-Martínez & Otero \(2009\)](#) who found that there are gender differences in mobile phone addiction and girls are more likely to be addicted to it. The present study agrees with the results of studies such as [Lopez-Fernandez \(2015\)](#) that there is no association between gender and mobile phone addiction.

The present study confirmed the findings of previous studies such as [De Sola et al. \(2017\)](#) and [Lopez-Fernandez et al. \(2015\)](#) in that a higher level of parental education is a risk factor for developing abnormal mobile phone use and that children who have at least one parent with a university degree are predictors that may lead to excessive internet and mobile phone use. Regarding the influence of family income on adolescents' mobile phone addiction, the present study confirmed findings of previous studies such as [Park & Park \(2021\)](#) and [Sahin et al. \(2013\)](#) in that lower- and middle-income households significantly increase the odds ratio of problematic mobile phone use by children.

6 Conclusion

The results showed that middle family income and parents with a higher education degree are factors associated with adolescent mobile phone addiction, while gender is a factor that showed no association. The second research question examined the extent to which organizational networks, peer networks and parental networks are associated with adolescents' mobile phone addiction. The results showed that voluntary organizations, parent networks, and peer networks have a negative effect on adolescents' mobile phone addiction, while no association was found between adolescents' participation in religious, political organizations, and school activities with mobile phone addiction. The third research question showed that we need some strategies to reduce the use of mobile phones among high school students, such as involving students in voluntary organizations, parents setting limits on mobile phone use and keeping their children busy with other activities. Also, teachers at school need to be more proactive in the classroom because this will give students less opportunities to take out their phones.

However, this study is not free of limitations. Initially, the sample size of the survey was limited ($n = 110$). In addition, this study was based only on the self-reported responses of the adolescents. Also, a limitation was that the study was based on secondary data, and could not pursue other interesting questions, such as the influence of online social networks on mobile phone addiction, and other predictors of excessive mobile phone use such as anxiety and depression. Finally, the time to conduct this research was limited (2 months).

Considering the limitations of this study, future research is needed to form a more concrete picture of the relationship between social factors and social networks. Future research may also describe other links between social networks and mobile phone addiction. Furthermore, it would have been useful if it was possible to apply the present study to a larger sample of participants to drive the results to generalizability.

Ethical approval

The research was approved by Department of Educational Sciences and Social Work of the University of Patras.

Conflicts of interest

The authors declare that they have no conflict of interest.

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